

ZMATH 2015d.00871

Fisher, Christopher R.; Wolfe, Christopher R.

Teaching Bayesian parameter estimation, Bayesian model comparison and null hypothesis significance testing using spreadsheets.

Spreadsheets Educ. 5, No. 3, 16 p., electronic only (2012).

Summary: Learning statistics is often characterized by tedium and frustration. To make matters worse, pervasive misunderstandings of conditional probabilities often impede learning. We present an interactive spreadsheet designed to elucidate such misconceptions through a comparison of three statistical approaches: Bayesian parameter estimation, Bayesian model comparison and null hypothesis significance testing. Learning is facilitated through the systematic exploration of each method and the use of graphical displays of the distributions. The conceptual underpinnings of each approach are described as well as their implementation in the spreadsheet. We conclude with some suggested pedagogical questions designed to elucidate the commonalities and differences between each approach.

Classification: K75 U75

Keywords: stochastics; university teaching; Bayesian statistics; statistical inference; Bayesian model comparison; null hypothesis significance testing; spreadsheets; computer as educational medium; conditional probability; misconceptions; conversion errors; distributions; graphical representations; normal approximation; Bayesian parameter estimation; Likelihood distribution; posterior distribution

<http://epublications.bond.edu.au/ejsie/vol5/iss3/3/>